

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

APRIL 3, 1943



Stock Pile

See Page 217

A SCIENCE SERVICE PUBLICATION

## Do You Know?

*Ammonia* has some 2,000 industrial uses.

Australia has more than one hundred kinds of *snakes*.

A *honey* crop of more than 400,000,000 pounds is produced in the United States each year.

*Timber* for war uses cut in national forests in 1942 was 70% greater in volume than the amount cut in 1939.

*New Caledonia*, 900 miles east of Australia, has among its 64 species of land birds five that exist nowhere else in the world.

Extensive *oil shale* reserves on this continent may be used as a source of gasoline and other petroleum products if necessary.

*Honeybees* survive the cold of winter by clinging together in a great ball, the bees on the inside frequently changing places with those on the cold outside layer.

Some 600 tons of *guayule* rubber are expected from 4,000 tons of shrubs gathered in January from a 550-acre plantation owned by the federal government in California and now being processed.

Spain is reported to be planning to make a synthetic camphor, a fuel substitute, and a rubber substitute from its surplus supply of *turpentine and colophony* which can not now be exported because of the war.

## Question Box

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Approximately 12 pounds of *manganese* go into each ton of steel to give it strength and workability.

Various chemicals, including creosote, are used to make *wood* resistant to fire, decay, and termites; the wood is impregnated under high pressure.

Six colonies of *beaver* in New York State, involving a total of approximately 15 years, cut 5,424 trees measuring from one inch to 17 inches in diameter, 7.6% being six inches or more in diameter.

Only about 10,000 of the 640,000 known *insect* species are destructive to the works of man.

Outbreaks of *hog cholera* have occurred in nearly every state in recent years, but effective controls prevent any from developing into major proportions.

In the beautiful majestic cumulo-nimbus *clouds* lurk many dangers to aircraft, including upward currents much stronger than gravity, electrical discharges, and perfect conditions for icing.

## SCIENCE NEWS LETTER

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## MEDICINE

# Anesthetic Has War Use

New method of making childbirth painless and safe may prove boon to war wounded. Men might be transported comfortably from battlefield to base hospital.

► THE NEW safe method of making childbirth painless and comfortable, called continuous caudal anesthesia, may prove a great boon to the war wounded, it appears from a report by Dr. James L. Southworth, Dr. Waldo B. Edwards, and Dr. Robert A. Hingson, of the U. S. Public Health Service. (*Annals of Surgery*.)

The new anesthesia has now been used in 255 cases in general surgery with only three failures, the doctors report. The cases included operations for femoral and inguinal hernia; Cesarean delivery of a baby; setting of broken bones, other orthopedic operations and amputations of legs and feet; and surgical treatment of varicose veins. It also shows promise as a method of treating thrombophlebitis in the legs.

"It would seem," the doctors state, "that this method is adaptable for use in the treatment of casualties both in civilian and military practice where it

would be desirable to have a safe, prolonged analgesia (absence of sensibility to pain) during the transportation and the physical and roentgenologic examinations of the injured."

One anesthetist with several trained corpsmen or medical attendants could handle a large number of patients at one time, they point out. It might be possible to give this anesthetic to some of the war wounded on the field and transport them painlessly to a base for treatment, thus perhaps reducing the instances of shock. The method might also be valuable in preventing the delayed shock condition usually referred to as "crush syndrome."

The new anesthetic method consists of continuous injection near the base of the spine of a pain-killing chemical, mety-caine. The drug temporarily blocks the nerve pathways for pain below the level of the umbilicus but does not cause unconsciousness. Its chief disadvantage for surgical operations is the time consumed,

30 to 40 minutes, to give the anesthetic and allow it to become complete. A skilled anesthetist, however, can have the patient ready for certain types of operations in 10 minutes.

*Science News Letter, April 3, 1943*

## MEDICINE

## Killing Virus With Light Depends on Hitting Spot

► DESTRUCTION by ultraviolet light of the virus type of disease germ depends on hitting a certain vital spot or "Achilles heel" of the virus, Dr. Harvey C. Rentschler, director of research at the Westinghouse Lamp Division, declared.

His statement was based on thousands of tests made with the aid of Miss Galina Mouromseff, staff bacteriologist, in which bacteriophage, a virus that destroys bacteria, was subjected to ultraviolet light barrage.

"This ability of ultraviolet to inactivate virus," Dr. Rentschler said, "means that science now has an effective weapon to use in the battle against influenza, infantile paralysis and the common cold among other diseases thought to be caused by virus."

*Science News Letter, April 3, 1943*

## ENGINEERING

## New Welding Method Aids In Upkeep of Railroads

► BY WELDING railroad rails together in thousand-foot lengths through a new technique, then skidding them along the old rails into the famed Moffat Tunnel, over 17,000 feet of old track has been replaced without holding up heavy war traffic for a single moment.

At the east portal of the tunnel, the rails were clamped together in a long line with molding boxes surrounding each of 23 joints.

Rails were heated at the joints to welding temperature. Evenness of heat in rail ends was measured by an instrument called an optical pyrometer.

Then a funnel-shaped crucible with chemicals spewing thermite fire, moved up to heat the welding material to correct temperature, as shown in the photograph. The molten material flowed down through the molding box to fill the crack between rails.

After cooling, the welded joint was radiographed, emanations from radium shining through the metal from the side opposite a camera. When the developed photograph showed a perfect weld, the



**SPEED WELDING**—This funnel-shaped crucible spewing thermite fire is welding rails for a quick replacement job.



joint was then buffed and smoothed off.

Pairs of the completed thousand-foot lengths were then towed into the tunnel. Skilled crews quickly slid aside the old track and installed the new. It took just 51 working hours to lay the track.

The new method was developed by experts of the Denver and Rio Grande Western Railroad in cooperation with the Metals and Thermit Company of New York.

*Science News Letter, April 3, 1943*

#### MEDICINE

### Warn Against Heat For Treating Shock

► WARNINGS AGAINST the use of heat for treatment of shock have just been issued by Dr. George E. Burch, assistant professor of medicine at Tulane University, who lectures on the subject to Army doctors studying at the university, and by Dr. K. G. Wakim and Dr. W. D. Gatch, of Indiana University School of Medicine. The last two report experiments on treatment of shock in the *Journal of the American Medical Association*.

First rule for treatment of shock in standard first aid manuals is to apply heat. This is wrong, according to both the Indiana and Tulane doctors. They state emphatically that patients in shock should be kept comfortably warm and protected from cold by wrapping in blankets. However, using hot water bottles or the like, as advised in first aid rules, overheats the patient and will aggravate the shock condition, the doctors warn.

A cold, clammy skin is present in shock. This may be what led to the idea of treating shock by heat. The cold, clammy skin, however, results from the fact that in shock the tiny blood vessels near the surface of the body are constricted. This constriction is a natural defensive mechanism designed to make up for the decrease in blood volume in shock. Applying heat defeats the purpose of the protective mechanism by dilating the blood vessels so that more, instead of less, blood must flow into them.

The Indianapolis doctors treated animals in shock with ice bags and with water bottles of temperatures ranging from room temperature (77 degrees Fahrenheit) to a really hot water bottle of 131 degrees Fahrenheit. Heat and cold greatly shortened the survival time of the animals but those kept at room temperature or near normal body temperature survived longest.

Using heat harms shock patients also: (1) by speeding up chemical reactions

in the body, thus requiring the use of more oxygen and possibly leading to fatal oxygen lack, and (2) by increasing per-

spiration, thereby adding to fluid loss, a condition already present in shock.

*Science News Letter, April 3, 1943*

#### SEISMOLOGY

## Mexican Seismograph

American scientists cooperate in arranging new instrument for National Astrophysical Observatory at Tonanzintla. Will study volcanoes.

► EARTHQUAKES and sleeping volcanoes in Mexico will be studied intensively by one of the world's most sensitive seismographs, to be installed in Mexico's National Astrophysical Observatory through the cooperation of American scientists and with the State Government of Puebla, headed by Dr. Gonzales Bautista.

The Mexican Ambassador, Don Francisco Castillo Najera, in Washington, announced the acquisition of the instrument, and Dr. Harlow Shapley and Dr. L. Don Leet of Harvard University announced that arrangements for the shipping and installation of a Benioff vertical-component seismograph, which has recently been thoroughly tested by Daniel Linehan of Weston College, have been concluded by the Committee on Geophysical Research in Harvard University. The instrument was provided by the National Research Council in Washington and was originally intended for use in the studies of local earthquakes. Recent events in Mexico have shown that seismographs of this type, located where they will contribute new information about Mexican earthquakes, will contribute also to knowledge of volcanic activity.

The seismograph will soon be installed at Tonanzintla, just east of the famous towering twin mountains, Popocatepetl and Ixtaccihuatl.

This new seismograph is one of the latest models of a type that has proven itself to be among the world's best. It was developed by scientists at the California Institute of Technology. Some of the earliest investigations with Benioff seismographs were made at Harvard University's Oak Ridge, Mass., station, resulting in the discovery of previously unsuspected minor seismic activity in this area. The great success of Harvard with this instrument has led to its widespread adoption both in this country and also abroad.

The seismograph produces a record of

ground vibrations in the form of lines on photographic paper. It is capable of magnifying ground motions by as much as 250,000 times. At Oak Ridge it records the passing of trains eight miles away as well as earthquakes on the opposite side of the globe.

Mexico is one of the best natural laboratories available for a study of the related problems of earthquakes and volcanoes. There are both active and recently extinct volcanoes and numerous earthquakes. Some of these earthquakes, in fact all that are in the volcanic regions, are unusual in that they occur at distances of around sixty miles below the surface. Just enough information has been accumulated in recent years to cause scientists to be considerably puzzled and extremely curious about the connection between these earthquakes and the volcanoes. This curiosity was sharpened recently by the reported appearance in Mexico of a new volcano in a region where such earthquakes have been occurring over a period of years.

These investigations into the relationship of volcanoes and earthquakes mark an interesting cycle in seismological thought. The earliest theories of the origin of earthquakes held that all earthquakes were caused by volcanoes. Subsequent opinions, based on new facts, held that all earthquakes were caused by crust-distorting forces, and that any relationship to volcanoes is purely coincidental. It now appears that the forces which produce earthquakes in certain areas may also be the cause of volcanic eruptions.

The installation of a high-sensitivity instrument in Puebla will provide an ideal opportunity, one of the few in the world, to study the day-by-day minor manifestations of the forces causing earthquakes and volcanic eruption, contributing perhaps ultimately to the solution of the larger problem of the origin of mountains.

*Science News Letter, April 3, 1943*

## MEDICINE

# Why Sulfa Drugs Fail

Increased production in germs of an anti-sulfa chemical is blamed for the fact that in some cases the sulfa chemicals fail to cure.

► THE REASON for failure of the sulfa drugs in some cases, development of a condition which doctors call sulfonamide resistance or sulfonamide fastness, has been traced to increased production by the disease germs of an anti-sulfa drug chemical.

Experiments showing this in the case of *Staphylococcus aureus*, the kind of germ that causes boils, carbuncles and abscesses, are reported by Dr. Maurice Landy, Dr. Newton W. Larkum, Dr. Elizabeth J. Oswald and Dr. Frank Streightoff, of the Army Medical School (*Science*, March 19.)

The anti-sulfa drug chemical is p-aminobenzoic acid which has recently been included as a member of the vitamin B family. Scientists found several years ago that the sulfa drugs achieve their germ-stopping and thus disease-curing action, at least in the case of certain germ infections, by interfering with the action of this vitamin the germs must have.

Increased production of the vitamin chemical by the germs was then suggested as the reason for the development of sulfonamide fastness by the germs, a condition which meant that even large doses of the drugs failed to

help the patient. The experiments by the Army Medical School bacteriologists, however, give apparently the first direct evidence that this is the case.

Strains of *Staphylococcus aureus* germs were exposed to increasing concentrations of sulfathiazole. In the course of this exposure they produced germ offspring which were resistant to the drug and which produced 70 times as much p-aminobenzoic acid as the parent, drug-sensitive strains.

These germs, moreover, continued to produce the vitamin chemical in amounts far in excess of normal for many generations after exposure to the sulfa drug. This furnishes additional evidence, the scientists state, for the permanence of sulfonamide fastness.

Other microorganisms, such as the germs of cholera, dysentery and pneumonia, may acquire resistance to sulfa drugs without producing more of the vitamin chemical, the scientists found. Their resistance to sulfa drugs may, it is suggested, be due to production of other, as yet unidentified anti-sulfa drug chemicals which play a role in the vital chemical processes of the germs.

*Science News Letter*, April 3, 1943



**FIRE WATCHERS** — Quantities of these small thermostats, formerly used in electric irons, are being installed in military equipment. A worker is shown spot welding the base of one of the fire detectors to the body.

"We can only speculate as to the importance of the other factors in human nutrition," Prof. Elvehjem concluded, "but I am willing to wager that equally important relationships will develop."

"As research continues we may learn from it nutritional means of handling diseases which are uncontrollable today as readily as we now control scurvy, rickets and pellagra."

Biotin, inositol and p-aminobenzoic acid are other new B vitamins which latest studies show may have significance in human nutrition, besides those with which biochemists, nutritionists and even lay persons are now familiar: thiamin, riboflavin, niacin, pantothenic acid, pyridoxine and choline. Two chemically unknown factors needed by the chick for growth and feather production and one or more factors of significance in guinea pig nutrition complete the tally of now known B vitamins.

*Science News Letter*, April 3, 1943

Sodium fluosilicate may be used to control the grasshopper pest.

Cotton rope treated with a new preservative is being used as a substitute for manila rope on ships; the preservative gives the cotton rope firmness and resistance to wear, and protection against marine organisms.

## MEDICINE

# Vitamin Cures Predicted

► VITAMIN or other dietary means of preventing and curing now uncontrollable diseases, as we now control scurvy, pellagra and rickets, is predicted for the future by Prof. C. A. Elvehjem, of the University of Wisconsin, in a Sigma Xi lecture to be given throughout the country.

Recent studies in his own and other research laboratories of the 12 or more B vitamins furnish the basis for Prof. Elvehjem's forecast for the future.

Lack of one of the newest B vitamins, folic acid, may be the cause of a blood disorder, a sort of white blood cell anemia, that develops occasionally in patients getting sulfa drug treatment and also sometimes without such treatment. The same condition develops in rats following

treatment with certain sulfa drugs, and it also develops in monkeys deprived of the vitamin. The reason the rats get the condition seems to be that the sulfa drugs stop the growth of microorganisms in the rat intestinal tract which normally manufacture some of the B vitamins.

In both monkeys and rats the white blood cell anemia, though induced by diet in the one case and by sulfa drugs in the other, can be prevented by folic acid.

In humans, Prof. Elvehjem suggests, the condition may develop following 20 days of sulfa drug treatment because the patients had been on short rations of folic acid and could not stand further depletion by the drug of their reserve supply of this vitamin.

PHARMACY

# Refugee Crops

Medicinal plants, formerly grown in far parts of the world, are now being adapted to the American way of plant life to ease war shortages.

By GLENN SONNEDECKER

► STRANGE new victory crops like deadly nightshade, henbane, stramonium and castor beans are now being grown by the nation's farmers. Botanical drugs, many of them strangers in a foreign land, are being adapted to the American way of plant life to ease important shortages.

Dr. D. M. Crooks and his associates in the Division of Drug and Related Plants guide the development of drug production here from amid the sprawling laboratories and greenhouses, and the rolling tests fields that make up the government's Bureau of Plant Industry at Beltsville, Md. Scope of the program includes experiments conducted in every state.

Of the shortages of European drugs that have received such wide publicity, Dr. Crooks reveals that all have now been replaced by American-grown products of equal or better quality than the original imports.

Some medicinal plants from other regions still have the experts stumped because they are not adapted to our soil and climate.

What about morphine, for example, and other pain-killing derivatives of opium, which medical men count among their most valuable drugs in either war or peace? Tales of a dwindling stockpile of opium hoarded in old U. S. Treasury vaults has caused this question to be raised by many a physician and pharmacist.

## Poppy Is Banned

Production of the opium-yielding poppy is specifically banned in the United States by the Opium Poppy Control Act because of the dangers of illicit traffic and addiction. Crude opium for the manufacture of medicinal supplies is imported through the Bureau of Narcotics from Persia, Turkey, India and elsewhere in the Orient.

Before this product can ease suffering in America, however, it must journey thousands of miles through the war zone. By plane, ship—somehow—opium is still getting through. But Uncle Sam is not content to depend on this slender line of

communication with the possibility of Turkey, India or other opium producers being blotted from the picture by war clouds.

Cooperating with the Bureau of Narcotics, the Bureau of Plant Industry conducted research and developed ways and means of producing opium here in case it is necessary. Results of the experiments are a carefully guarded secret. But it can now be revealed that the government has the information and suitable seed at hand to produce this valuable medicine in quantities to fill the needs of both the armed forces and civilians, should a war shortage develop.

Another vital drug, belladonna, is usually imported from around on the opposite side of the globe from the opium growers. This broad-leafed herb, also called deadly nightshade, has always flourished readily in certain parts of this country. But mainly because of cheap labor pharmaceutical laboratories have depended on growers in Central Europe to provide the crude drug.

From the leaves or roots are extracted potent white crystals used in various

forms to relax asthmatic spasms, dry and dilate bronchial tubes and relieve pain. Eye specialists use certain forms of it extensively in examinations because it paralyzes the adjustment mechanism of the eye and dilates the pupil.

The women of old Italy were also familiar with this dilating action and used it to give their eyes a more alluring luster—whence the name belladonna, which means "beautiful lady."

## Started Two Years Ago

This old and still important drug might soon be disappearing from medical kits if research had not been started two years ago by Dr. Crooks and his associates. At Beltsville they increased plantings of selected strains, then collected the seed harvest and replanted for more seed. By last spring they were ready to distribute the seed to 200 prospective growers with suitable soil and equipment in Wisconsin, Ohio, Pennsylvania, Tennessee, Virginia and other states.

It's a small specialty crop—only 500 acres were planted in all. But from it and a few other scattered plantings came enough deadly nightshade to meet our military and civilian needs. Content of active constituents in the crude drug averaged almost twice the standard in the U. S. Pharmacopoeia, an official book of drugs.



**YOUNG PLANTS**—Propagated drug seedlings are being inspected in an experimental greenhouse.





**BELLADONNA**—This important medicinal plant is shown being harvested from test plots and weighed to determine yield.

Stramonium is a drug with action similar to belladonna and of the same family. Although imported from Europe for economic reasons, it grows wild in the middle half of the United States as the evil-smelling jimsonweed or thorn-apple. When war came and prices shot up, all that remained to do was increase collections from the countryside. Cultivated plots were also expanded and shipments have begun from South America.

As a result, it looks as though a surplus has developed. Like many other drugs, stramonium is needed but only in relatively small amounts.

"We've tried to guide drug production to those who have a chance to make something out of it and at the same time make a valuable contribution to the nation's welfare," Dr. Crooks explains. "From the standpoint of land utilization drug growing is insignificant, but from the standpoint of importance as medicine it is vital."

#### A Parasite

Ergot is an important drug that requires no additional land at all for production. It is not a green plant but a tiny parasitic fungus that infests fields of rye and grows in place of the grain during warm moist weather.

Ergot contains powerful medicinal principles of value in preventing hemor-

rhage after childbirth and hastening delivery.

In this country, ergot has been screened out of our rye grain and thrown away. Otherwise it would turn up in beer or bread, causing widespread poisoning in the form of spasms and circulatory disturbances or gangrene. In olden times, it was not unusual for people's limbs to drop off mysteriously—later this was proved to be gangrenous ergot poisoning.

But in proper dosage doctors need preparations of this peculiar drug. Considerable quantities were imported from pre-war Russia and Spain, for there it could be produced most cheaply.

With foresight, the government has built an ergot stockpile. Supplies are now being augmented by ergot processed from rye screenings of United States mills.

Digitalis or foxglove, the invaluable heart remedy, is a drug familiar to many gardeners for its ornamental purple flowers. Escaping into meadows and pastures, it now grows wild in many localities and is especially abundant in the Pacific Northwest. Collections of these plants, coupled with increased production of drug farms, quickly made up for the lack of European imports. Excellent quality of the American product and a new official method of standardizing the heart medicine by testing it on cats in-

stead of frogs, should result in an even better product than we had before the war.

Drugs that have been cut off from the Pacific area are not so easily replaced. Many are slow-growing trees, vines and shrubs, often fussy about proper climate.

Here South America is playing an important role. It is the natural home of cinchona trees, for example, from which we get quinine. But samples which Dr. Crooks and his associates are receiving for analysis confirm that the trees contain relatively little quinine.

Since regular imports from the South Pacific have been cut off, the Bureau of Plant Industry in a cooperative project with the Board of Economic Warfare and other agencies is supplying improved high-yielding cinchona strains for South American planting. Experiments increased the active constituents in the bark of some selected strains to 10% compared to about 4% yield from the native trees.

It is believed that many other drugs that have come from across the Pacific could also be produced successfully by our neighboring republics.

Castor beans are exported from Brazil, but here again our main source was formerly far-off India.

Experts were wondering what could be done to fill the nation's needs for castor oil which even in peacetime demanded imports of more than 140 million pounds. Although castor oil still has considerable medicinal use, most of the supply is used for a variety of industrial purposes. War has skyrocketed these demands to enormous proportions.

#### Seed Production Program

So Dr. Crooks and his associates at the Bureau of Plant Industry went into action. After extensive tests they entered upon a seed production program of three selections of castor plants in cooperation with the Agricultural Adjustment Agency and Commodity Credit Corporation. Still in progress, this project is expected to yield 5,000,000 pounds of seeds at the end of the coming season.

Commercial production of castor beans will then be launched if war transportation fails to supply sufficient imports.

Research is also being conducted with an eye toward establishing castor beans as a permanent part of post-war agriculture.

Some of the other newcomers may also stay on after the war, finding their niche among specialty growers of drug plants who are content with a small crop of great importance.

## MEDICINE

**Convalescent Serum Used To Treat "Shipyard Eye"**

► "STRIKING clinical improvement" in nine out of 10 patients suffering with "shipyard eye" has been achieved by injections into the veins of blood serum from other patients already recovering from the eye condition, Dr. Alson E. Braley and Dr. Murray Sanders, of New York, report (*Journal, American Medical Association*, March 27).

The group of cases treated is small and further studies with control cases are needed, the doctors point out, before convalescent serum can be accepted as a cure for the condition. However, since this eye ailment is occurring in epidemics in industrial areas in many parts of the country, and since no other treatment has materially shortened the course of the disease, the New York doctors feel justified in calling attention to the possibilities of convalescent serum treatment.

Seven of their 10 patients were "clinically cured," six of them in 48 hours. In two others the normal course of the disease was shortened and corneal changes possibly aborted. One case is classed as a failure because adequate information following treatment could not be obtained.

*Science News Letter, April 3, 1943*

## ENGINEERING

**Castor Oil Serves Many Purposes in the War**

► CASTOR OIL is "bad medicine" for the Axis; presently Mussolini and his pals will be wishing they'd never heard of the nasty stuff. It turns up at war in all sorts of unexpected places, all the way from the hydraulic fluid that fills the recoil-absorbing cylinders of big guns to the paint that protects ships' bottoms. Some of these uses were detailed before the Ninth Annual Chemurgic Conference by J. Edmund Good, vice-president of the Woburn Degreasing Company of New Jersey.

Castor oil mixed with alcohol makes a good fluid for recoil cylinders, hydraulic brakes and the shock absorbers on airplane landing gear because it retains its consistency at all outdoor temperatures, not thickening and getting stiff as many other oils do when the mercury slides down below the zero mark. Russian gunners and truck drivers could tell you a thing or two about that; so could our own fliers who take Flying Fortresses and Lightnings up into the perpetual Arctic that reigns at the 30,000-foot altitudes.

Another usefulness of castor oil to aviators is hidden in the white folds of their nylon parachutes, for from castor oil comes sebacic acid, one of the chemical building-blocks of nylon in one process of manufacture.

Not from castor oil, but from the stems and leaves of the castor plant, a new form of sudden death is extracted, useful in a different kind of war—the unending campaign that farmers and orchardists have to wage against insects to save our food. It has long been known that castor-plant foliage is extremely poisonous, but this is the first practical use of it that has been made for insecticide purposes.

Until now, we have obtained all our castor oil from overseas sources, some of which are now in enemy hands, and all of which are under the handicap of shipping lack. So strong efforts are now being made to get castor-bean growing, once a thriving industry in the United States, back into action again.

*Science News Letter, April 3, 1943*

## MEDICINE

**Sulfa Chewing Gum Developed as Remedy**

► THE DEVELOPMENT of a kind of sulfa drug chewing gum as a possible remedy for severe sore throats is announced by Dr. John H. Arnett, Dr. Wesley W. Spink, Dr. Ruth Boynton and Dr. Suzanne Agnew, of the Episcopal Hospital, Philadelphia, and the University of Minnesota Medical School, in a report to the Society for Experimental Biology and Medicine in New York.

The sulfa "chewing gum" is a paraffin block, of suitable size for chewing, in which sulfadiazine or some other sulfa drug is incorporated by mixing with melted paraffin and allowing the mixture to harden.

Use of the sulfa chewing gum by patients with acute pharyngitis or tonsillitis caused by streptococcus germs has not been tried long enough to tell how effective this method of giving a sulfa drug may be. The scientists found, however, that when patients chewed the paraffin-sulfa drug block, "remarkably high concentrations" of free sulfadiazine were maintained in the saliva.

This would have the effect, they believe, of getting the sulfa drug directly to the throat and tonsils where it might exert its curative effect, without the disagreeable side effects of the sulfa drugs which sometimes occurred when they gave them in moderate doses in capsules.

*Science News Letter, April 3, 1943*

**IN SCIENCE**

## HORTICULTURE

**Rationing Lifted on Peas Intended for Garden Seed**

► VICTORY gardeners will not need to surrender any of their precious ration points to get pea and bean seeds, the Office of War Information states. Rationing restrictions have been lifted on dried peas, beans and lentils intended exclusively for planting.

Thrift in the use of packaged seeds is recommended by the Department of Agriculture. It is pointed out that seedsmen, in order to give their customers a good dime's worth, have the habit of putting four or five times as many seeds into each ten-cent package of tomato, pepper, parsley and certain other vegetables as the ordinary home garden requires. The Department suggests that Victory gardeners arrange to share seeds, just as they take turns in using some of the now hard-to-get heavier garden tools.

*Science News Letter, April 3, 1943*

## ENTOMOLOGY

**Honey Bees Contract Disease; Queens Killed**

► NOSEMA is a little known disease of honey bees, but it has been disastrous to many colonies because it kills the queen bees or stops their egg-laying. It infects worker-bees also but their loss does not prevent the production of future colonies.

Nosema seems to be associated with some types of dysentery, state C. L. Farrar and C. W. Schaefer of the United States Department of Agriculture, who have been studying the disease with scientists of the Wisconsin Experiment Station.

No adequate control for nosema has been found. It is more serious in colonies in the late winter and early spring months. This suggests that long confinement aggravates the problem. When bees fly out a great deal there is less chance of infection to spread. A mixture of pollen and soybean flour in the winter months is recommended to keep the bees in disease resistant condition.

*Science News Letter, April 3, 1943*



# CE FIELDS

## RESOURCES

## Japs Have Rich Source For Raw Material of TNT

► JAPAN has one of the richest sources of high-grade toluene, raw material for TNT, in the oil from the great fields in Borneo, states B. Orchard Lisle (*Army Ordnance*). Mr. Lisle was formerly an editor of technical oil journals, and is now with the U. S. Army Air Forces.

Bornean crude oil is exceptionally high in toluene content, he states, and extraction with equipment now operating in Japan is easy. It is probable that the Japanese are already using at least some of the oil from Borneo, for the wells there are relatively shallow and easily re-drilled; and it is not certain that during the first rush of the Jap invasion they were thoroughly demolished anyway. The foresighted enemy planners also had oil-field experts openly in training for the conquest they as openly stated they intended to undertake.

*Science News Letter, April 3, 1943*

## BOTANY

## Oriental Flowering Cherry Not a New Name

► ORIENTAL Flowering Cherry, as applied to the beautiful ranks of trees that surround the Tidal Basin in Washington and frame the new Jefferson Memorial, is not a new title, applied under the spur of wartime emotion to remove the stigma of an enemy-alien name. Botanists in the U. S. Department of Agriculture have never called it anything else, insisting always that the popularly bestowed title of Japanese Flowering Cherry was incorrect because the tree is not native to Japan but to the Asiatic mainland, in particular Korea and China.

Confirmation of this official stand is now forthcoming from a scholarly Japanese source: the standard reference work that in Japan corresponds to the *Encyclopedia Britannica* in English-speaking lands. This Japanese encyclopedia definitely states that the tree is

native to an island off the coast of Korea, though it omits mention of its presence elsewhere. It adds that it was brought to Japan in the last half of the nineteenth century, and that its cultivation spread rapidly throughout the empire. The story of its introduction into the United States is well known.

Translation of the full text of the Japanese encyclopedia article follows:

"Somei-sakura ('Somei cherry'), *Prunus yedoensis*, is commonly called Yoshino cherry, but is in fact a distinct species from it. Somei cherry is said to have been cultivated first in Japan by Hanado at Somei in the early years of the Meiji era (1868-1912), but its original habitat was ascertained to be Futsuryu Island, Korea, by Dr. Kohara, Kyoto Imperial University, in 1932. The species has spread not only in and around Tokyo, but also all over the country. The flowers and leaves do not appear at the same time, the latter growing after the former have been shed. The buds are red in the beginning, but as the flowers blossom the color turns pink and then finally white. The growth of the tree is rapid. The tree is easily damaged and is relatively short-lived as compared to other species."

Cherry-blossom time in Washington in this wartime spring is expected to be about April 4, if normal weather for the season prevails. Thousands of recently arrived war workers in the city, and men on leave from nearby army camps, will see them, but the customary throngs of tourists will be absent.

*Science News Letter, April 3, 1943*

## INVENTION

## Fine Glass Filaments Made Stronger and Less Brittle

► GLASS filaments of spiderweb fineness, used in fabrics, insulation, etc., can be made stronger and less brittle by a method developed by a German, Armand Lamesch of Herzogenrath, near Aachen. His patent, no. 2,313,296, is vested in the Alien Property Custodian.

Secret of the strengthened filaments is their use of two kinds of glass, of differing coefficients of expansion. In one method of manufacture, a rod with a core of a second kind of glass is heated and spun out; in another, two concentric nozzles deliver the two kinds of glass simultaneously in molten condition. In any case, the resulting filament, no matter how finely drawn, still has the strong, sheathed core structure.

*Science News Letter, April 3, 1943*

## CHEMISTRY

## "Soapless Soap" Reserved For American Fighting Men

► "SOAPLESS SOAP," which makes water wetter and may be used in hard, soft, alkaline or acid water, and even in salt water dipped up from the ocean, is now used by American soldiers and sailors all over the world.

This new type of cleansing material is made with a base of petroleum or coal tar. It is known as a synthetic detergent. It will combine with whatever water is available to form a penetrating solution which rapidly reaches into the fibers of the clothing being cleaned. Greasy particles are removed without the formation of insoluble suds by this wetting process, as it is called in industry.

The detergent acts more quickly than common soaps so that the danger of shrinking of woolen materials being washed is lessened.

Soldiers in the field must do their laundry whenever the opportunity permits and must use whatever water is available. Sailors use sea water. Ordinary soaps made by treating fats and oils with an alkali can not be used with some of the waters encountered. It was desirable to find a cleansing material that could be employed under all circumstances. The result is the development of this new cleansing agent by the chemical industry, working with the Army, the Navy, and the War Production Board.

A toilet soap has also been developed which may be used by the fighting man regardless of the type of water in which he has to clean himself. Both the laundry and the toilet cleansing agents look like soap which causes them to be dubbed soapless soap. Like many soaps they reduce the effects of disease germs.

*Science News Letter, April 3, 1943*

## METALLURGY

## Tin From South America Is Processed in U. S.

See Front Cover

► THE STOCK PILE shown on the front cover of this week's *SCIENCE NEWS LETTER*, is of the strategic ore, tin. Brought from the mines of South America in bags, the ore goes through a crusher in a Southern smelter in the United States. It is then stored in these large stock piles. Later the pure tin will be extracted for use in war industries.

The cover illustration is an official photograph of the Office of War Information.

*Science News Letter, April 3, 1943*

## PUBLIC HEALTH

# Plan to Solve Milk Problem

National subsidies, freezing of key personnel in dairy industry, education and zoning distribution involved in proposal before health authorities.

► A PLAN for solving the milk supply problem, involving national subsidies, freezing of key personnel in the dairy industry, instruction of farmers' assistants and zoning distribution, was presented by Dr. J. T. Phair, chief medical officer of health for Ontario, at the Conference of the State and Provincial Health Authorities of North America in Washington, D. C.

Results in control of milk-borne diseases, he pointed out incidentally, have been remarkably good in spite of constantly presenting difficulties. No outbreak of illness traceable to contaminated milk has yet been reported in Ontario, a province which provides training facilities for all branches of the armed forces to a greater extent than any other in Canada.

For solving the milk production problem, Dr. Phair proposed: 1. a national subsidy to encourage greater production of fluid milk of acceptable quality; 2. short courses of instruction in the essentials of milk production in all secondary schools serving small urban and rural areas; 3. comparable standards for all milk sold whether for human consumption as fluid milk or dairy products; 4. an emergency declaration of what is fundamental to insure a reasonably good quality of pre-processed milk and adherence to this both in equipment and method.

Remedies suggested for the difficulties in processing: 1. freezing of key personnel plus national subsidy to permit more adequate payment to experienced help; 2. establishment of energetic research by manufacturers to insure availability of equipment in which wood, glass and plastics substitute for metals no longer available.

For distribution, the field in which public concern has been most evident, Dr. Phair proposed zoning of distribution, under which circumstances horse-drawn vehicles could be more generously used, or municipal ownership of milk-processing and distribution.

"Consideration may have to be given," he said, "to the feasibility of the more generous provision of powdered or condensed milk as a substitute for fluid milk."

Alternate day deliveries as a solution presents the problem of the "known inadequacy of domestic refrigeration," he said. An estimated 30% to 40% of the urban population would be forced by alternate day deliveries to try to keep milk for 48 hours "under impossible conditions, which milk is often three or four days old at the time of delivery, or to purchase their supply daily from the local grocery or provision store with accompanying difficulties of returning bottles and so on."

*Science News Letter, April 3, 1943*

## BOTANY

# Weeds Go To Work

► EVEN WEEDS have gone to work to help win the war.

The Ninth Annual Chemurgic Conference meeting heard from two Chicago pioneers in getting uses out of plants generally considered useless—milkweed and cattail.

Milkweed floss, used in lifebelts and floats to replace kapok from lost overseas sources, is being separated from its seeds in a factory by Dr. Boris Berkman, who was a military surgeon in the Russian army during the first World War. Last year's crop amounts to 50,000

pounds of the silky, white stuff—a veritable mountain of floss. The U. S. Government has taken every pound that could be supplied, and has contracted with Dr. Berkman for a great deal more.

Practically all of the milkweed pods thus far used in Dr. Berkman's factory come from a large tract of cutover timber land in northern Michigan, where the sandy soil is so poor that it cannot be cultivated. Farmers in the neighborhood last summer found picking milkweed pods a good source of cash income—between four and seven dollars a day.

Dr. Berkman has found a ready market for the milkweed seed from which a high quality oil can be extracted. It resembles soybean oil in its properties and possible uses. He also expects to get other byproducts from pod shells and stalks.

Cattails are the other weeds that have gone to work. Their story was presented by Dr. C. F. Burgess, who is president of a large storage battery concern. Cattail floss, though different in appearance from milkweed floss, has much the same uses: lifebelts and floats, heat and sound insulation, filling for cushions and so on. Cattails grow in swamps and on pond margins all over the country, and their heads or spikes are hand-harvested as a part-time occupation by country lads, Boy Scouts and anybody else who wants to make a little extra cash. Dr. Burgess stated that on a cost per pound basis the material can compete with cotton.

One valuable feature about the cattail harvest is that it can be continued through almost the entire year. In the north, the heads are ripe in August, and stay on the plants through most of the winter. Then southern cattails come in, permitting an almost continuous flow of material to the processing plant.

*Science News Letter, April 3, 1943*

## ASTRONOMY

# Sunspot Activity Should Hit Low Point in 1944

► THE MINIMUM of the present cycle of sunspot activity should occur early in 1944 if it is as short as the last two, Mrs. Elizabeth Sternberg Mulders of the Mount Wilson Observatory states in a report to the Astronomical Society of the Pacific. Her prediction is based upon the numbers and positions of over 3000 spot-groups recorded at Mount Wilson since the last minimum in 1933.

Although the average length of the solar cycle from one minimum to the next since 1800 is 11.3 years, the last two cycles were only 10.0 and 10.2 years in length, respectively. The present cycle was much more active than the former, but the trend of activity is remarkably similar between the two, indicating that minimum may occur again about a year earlier than the average. If it does, it will be the first time that three successive cycles have ever had so short an interval.

During 1942, the sun was under observation at Mount Wilson on 341 days, the best record since magnetic observation of spot-groups began in 1917, Mrs. Mulders stated.

*Science News Letter, April 3, 1943*

# AMERICA'S WEAPON TO UNCOVER NEW SECRETS



Two years ago, the RCA Electron Microscope made its timely and dramatic entry on to the stage of crucial global strategy—two years in which the struggle shifted from “blitzkrieg” techniques to the cold, emotionless battlefields of science.

Those two years have found research workers in great industries, laboratories and universities laboring tirelessly on problems whose solutions even now, though secret, are making themselves felt directly or indirectly in the great war in which we are engaged.

The RCA Electron Microscope becomes increasingly important as America's weapon to uncover new and valuable secrets. It is in the front line of every modern scientific attack upon the obscure and hidden mysteries of the sub-microscopic world.

We pay tribute, on this second birthday of the RCA Electron Microscope, to those progressive institutions and brilliant scientists who are helping in the battle of today and the building of tomorrow.

1. Pearlite, a special form of carbon steel.
2. Bacteriophage attacking and destroying germs.
3. The windpipe of a mosquito larva.
4. A diffraction pattern, enabling the atomical analysis of a structure.

Photographed by C. K. Fitzpatrick, courtesy of Interchemical Corp.



## RCA ELECTRON MICROSCOPE

RCA Victor Division, RADIO CORPORATION OF AMERICA, Camden, N. J.

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Monsanto Chemical Company  
Mount Sinai Hospital, New York  
National Naval Medical Center  
New Jersey Zinc Company  
Standard Oil Co. of New Jersey

United States Bureau of Standards  
United States Department of Agriculture  
United States Naval Research Laboratories  
United States Rubber Company  
Westinghouse Electric and Manufacturing Company  
... and many others







# Science Clubs Help in War



Since September 1942 the number of clubs in Science Clubs of America has doubled. There are now more than 2,192 of them all hard at work in their school laboratories, in home workshops, in basement laboratories, in club quarters of assorted kinds. They are learning science but they are applying this knowledge right now in real active service on the home front. Any interested group may join the SCA without cost. Write to 1719 N St., N.W., Washington, D. C.

Well aware of the shortage of trained scientists and skilled workmen, the tens of thousands of boys and girls who make up Science Clubs of America are studying their favorite sciences to prepare themselves as professional scientists, or as accomplished amateurs but are making every effort to give their country the benefit of their training now.

Members range in age from 10 years up but their range of activities is amazing. They buy war stamps and bonds as do all patriotic Americans. They collect rubber, silk, metal, books for service men, and myriads of other materials that civilians have been called upon to collect or conserve. They belong to their school Victory Corps and handle most of the science assignments in it. They volunteer individually or in groups for the protection of the civilians in their communities. They give and take courses in home nursing and first aid. Many have given blood. They build model planes by the hundreds and send them away for instructing civilians and service men in plane detection. They conserve food and show others how to eat nutritious meals in spite of rationing. In every way they attempt to conform to their war time world.

But these members of Science Clubs of America are not content to contribute just what is expected of them. They go farther than that and though their school work is heavier in these days of accelerated programs they find time to do a great assortment of war service which they have designed and set for themselves in the pattern of ingenuity that is American.

News of their war work comes in regularly to SCA headquarters. They have a double reason for reporting. First, it is the tradition among scientists to share information with one another, and, second, every club that finds a good way to contribute to winning the war is patriotically required to pass along the news to other clubs.

Only a few club reports can be given here but enough to show the sincere and effective work being done voluntarily by members of Science Clubs of America from coast to coast.

**JAMESTOWN, N. D.**—The Science Club in the Jamestown Junior High School, with 29 members, 15 years of age or less, keeps the public informed on science in the war effort by regular weekly radio broadcasts over KJJB. In their salvage drive they concentrate on rubber jar rings and have collected many pounds. Miss Epsy Colling is the sponsor of these 17 boys and 12 girls.

**ALTO, TEX.**—The 30 members of the George Washington Carver Club of Booker T. Washington High School are newly organized but are already alleviating the manpower shortage. They have repaired the electric clocks and bells in their school, wired the church in their community for electricity, painted their school building and in their spare time have held lengthy discussions on science and war. Their sponsor is Mr. V. E. Tinsley, principal of the school.

**CARSON CITY, MICH.**—A few of the projects going on in the new club at Carson City High School, called the Searchers, are: an attempt to develop a rayon with a finer thread and a higher gloss; experiments on plastics, industrial alcohols, sugars from new sources, and medicines. The physics members are helping to equip the laboratory by repairing old and manufacturing new pieces of apparatus, mostly electrical. If the science classes in this school are overcrowded next year the blame may rest on the enthusiasm aroused among the students by an exciting program staged by the club. A feature of this was a demonstration of a thermite incendiary bomb and incendiary "calling cards," followed by a demonstration of how these menaces can be brought under control. Mr. Hubert C. Smith is the sponsor.

**CLAYTON, MO.**—The increased volume of subject matter presented to students in today's accelerated programs is being taken care of in the John Burroughs School in an efficient manner. The 33 members of the Langmuir Chapter, under the sponsorship of Mr. E. S. Obourn, head of the science department, have undertaken the responsibility of training younger students in the school in the following: meteorology, aeronautics, radio, automobiles, and photography. Since this club has been in existence a number of years the members, whose ages range from 14 to 18, have had the benefit of years of study of their own special interests in many fields.

**GREAT NECK, N. Y.**—The Arassiz Club of 30 boys and 14 girls in Great Neck High School is sponsored by George E. Noyes who is a Biology teacher. The members are now in the process of getting their victory gardens started. They

have grown large numbers of tomato and other seedlings for distribution to all members and their families and hope to raise some money for the club by selling excess plants.

**PHILADELPHIA, PA.**—Rev. Thomas Reidy, O.S.F.S., of the Northeast Catholic High School for Boys, has a club of 20 between 14 and 18. They are especially keen about microtechniques in bacteriology. Recently they made an incubator for some of their work in embryology and found it equally useful in the culture of plates that require regulated temperatures. Their war work concentrates on first aid and they have made an intensive study of medicinal plants.

**PORT ARTHUR, TEX.**—Mr. Charles Ross, science teacher in the Stephen F. Austin School, sponsors the Senior Science Club which has 18 members ranging from 13 to 18 years of age. The club makes model airplanes and learns first aid, issues weather predictions twice daily and maintains a photographic dark room. Whenever an ex-member now in the armed forces comes home, they hold a special meeting to talk over old times and listen to suggestions from the returned service man on how to study now to be ready for future service. Members also put on chemical magic shows before meetings of the P.T.A., and other groups.

**MITCHELL, S. D.**—The Bi-Ways Club of Senior High School has as their sponsor the biology instructor, Miss Helen Field Watson. They have carried on experiments for more than a year on various kinds of fertilizers in relation to plant growth. Now, with fertilizer use restricted, they are concentrating on the study of how the disposal from their local sewage system can be used in the raising of crops in their community.

**CRISTOBAL, CANAL ZONE**—The sixteen members of Torrid Zone Wizards are newly organized under Mr. Carl F. Maed in the Cristobal High School. They plan to make collections of the flora and fauna of their community. But they also study metals essential for war industries so they will know what to save and salvage.

**CAMP HILL, PA.**—The Lawrence Science Club is organized in Camp Hill High School with Mr. D. L. Knorr, head of the Science Department, as sponsor. The 21 members, all boys, are 14 to 18 years old. Their club is eight years old. They conserve their rare chemical laboratory supplies and show war films to the student body. They have repaired the bell-wiring system for the school; installed stage-lighting, including rheostats.

To be useful in their community they take first aid, serve as airplane spotters, spot and report erosion problems, plant trees.

The club has great sport exploring caves near them.

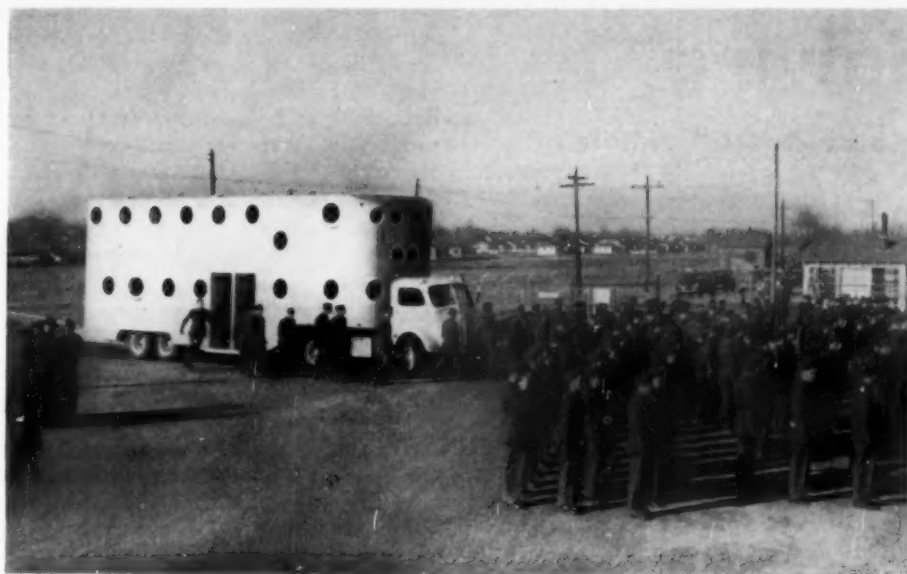
**MOUNT VERNON, N. Y.**—Miss Gertrude Wheeler, biology teacher, is sponsor of the Biological Club in A. B. Davis High School. The 14 boys and 4 girls who compose this 3-year-old club are putting all their efforts this year on the study of blood. They are learning to make red and white blood counts, blood smears and their interpretations. Blood typing will come later and urinalysis. Many members of this club want to be medical technicians.

**SAN ANTONIO, TEX.**—Rev. John E. Messner, S.M., is the sponsor of Kappa Sigma Kappa in the Central Catholic High School. Its 40 members are all boys between 15 and 17. Among other patriotic ventures, they have lately helped officials to clean up the neighborhood of household pests such as rats, roaches, etc. The members learned how essential such precautions are to public health and were glad to do their part to fill in for authorities now busy with other war work.

**SOUTH BEND, IND.**—Eighteen boys and 2 girls compose the Science Club of John Adams High School. Their sponsor is Mr. Paul Reber, science teacher. The club is actively studying chemistry, biology, astronomy, physics, aviation and navigation. They have started to build a 6-inch reflecting telescope. To enrich their program they have joined the Indiana Junior Academy of Science, the St. Joe Valley Astronomers Club and the local branch of the American Chemical Society. Recent meetings have been devoted to the subject of synthetic rubber, learning to use the slide rule and chemical warfare.

**BRONX, N. Y.**—The Aeronautical Society of the High School of Science is wholly devoted to the study of all fields of flying. The forty members—all boys—have a record to aspire to for though their club is only 3 years old many of their former members are already air cadets, instructors or on the ground crews of the air corps. Dr. Alexander Joseph, Instructor in Aeronautics, is their sponsor and shares their intense interest in aviation.

While they spend much of their meeting time in making models, experimenting and preparing themselves for ultimate army or navy air service they are not too busy to serve their community. They have built equipment for other aeronautics classes, built and erected air craft spotting equipment, prepared demonstration wind tunnels, and set up pilot trainers.



**CAPACITY, 250**—This huge bus with two full decks has more cubic capacity than a box car and will carry more than 250 soldiers. The low center of gravity makes it safe at high speeds.

## ENTOMOLOGY

## Sabadilla Now a Spray

Powdered seed, long used as insecticide against lice and roaches, may replace pyrethrum as household weapon against flies and crop spray.

► **POWDERED SABADILLA** seed, long used as an insecticide to destroy lice and roaches, has now been processed so that it can be used as a spray, and it may replace the war-limited supply of pyrethrum as the active poison in many household and crop sprays.

Tests with the new sabadilla spray show it to be entirely satisfactory in the control of house flies. Tests with crop insect pests have not been carried to completion but preliminary results indicate that the spray will be equally effective in their destruction.

The development of sabadilla spray is the work of T. C. Allen and Robert Dicke of the agricultural staff of the University of Wisconsin. They set out to find an American substitute for the Japanese pyrethrum. The present supply of sabadilla is imported from Central and South America, mostly from Mexico and Venezuela. About 300,000 pounds are used each year for the powdered lice and roach exterminator. Some 3,000,000 pounds will be needed if it is to be used to replace pyrethrum completely.

A North American variety of saba-

dilla is now found as a weed in Texas. It has not been used because the powder made from its seeds did not seem to have insecticidal properties. In the new spray it is highly effective. It would seem that the United States may therefore raise much of the total amount of sabadilla needed in addition to the available Latin-American supply so that we may be completely independent of the Japanese product.

*Science News Letter, April 3, 1943*

## ENGINEERING

## Giant Bus Is Built To Transport Soldiers

► **IT LOOKS** so huge that you look for tracks under it, are surprised when there are none. It's 45 feet long, 10 feet wide, 15 feet high, with more cubic capacity than a box car. It rolls up to the gates of huge Camp Carson and soldiers emerge in a seemingly endless stream. Not until 250 or so have come out, like the crowd emerging from a telephone booth in the old Keystone comedies, is

it empty. Then it lumbers off after another load.

It's a bus, but what a bus. Camp Carson soldiers formerly had to hoof it because Colorado Springs Bus Co. could not get conventional buses.

The company asked Dean Gillespie, automotive engineer, to design one out of non-strategic materials.

He thinks the resulting bus is just what the doctor ordered for many a war-congested industrial community to get workers to their jobs and back home. It's light—27,000 pounds with tractor. Two full decks, above and below, seat 100, with wide aisles for standees. It can safely go as fast as any bus, due to a low center of gravity.

More are on the way. The first took about 90 days to build, but they can be built much quicker once the first few are off the line.

*Science News Letter, April 3, 1943*

## INVENTION

## Cooked Foods Can Be Dehydrated By New Process

► **DEHYDRATED** foods now being shipped in immense quantities to our armed forces and to our overseas allies are prepared by putting raw vegetables and meat into the drier, separately. A process for dehydrating complete cooked dishes, like soups, puddings, or pork-and-beans, is the subject of patent 2,308,601, issued to a Swedish inventor, J. G. W. Gentile of Stockholm.

In this process, the prepared cooked food is subjected, in a vacuum chamber, to short-wave infra-red radiation at a temperature at least 100 degrees Centigrade above the boiling point of water, until the greater part of the contained moisture is driven out. Then it is packed for shipping. To use, the dried food is simply "rehydrated" by adding water and heating.

*Science News Letter, April 3, 1943*

### WANTED

#### PRODUCT DEVELOPMENT ENGINEER

—Preferably one with several years industrial experience. Position requires mechanical ingenuity, inventive ability and enthusiasm for scientific matters. Opening is with established manufacturer of electrical household appliances and other things. Excellent working and living conditions.

Swartzbaugh Mfg. Co., Toledo, Ohio

## ENGINEERING

# High-Speed Sawing

New method of cutting hard aircraft metals at extremely high speeds is announced. Two half-inch pieces of armor plate cut at one time.

► AIRCRAFT METALS are being sawed at extremely high speeds by a new method, Arthur A. Schwartz of the Bell Aircraft Corporation, announced at the meeting of the American Society of Tool Engineers.

Engineers started with a wood saw on which the blade travels 12,000 feet per minute. After making some carbon steel blades, they experimented with such factors as temper and set of the teeth. Results were surprising.

"We cut non-ferrous materials and ferrous materials," Mr. Schwartz declared, "soft steels and very hard steels, in fact, the harder the steel, the easier it cuts."

Two half-inch pieces of armor plate are sawed by the new device at one time. Heat generated by friction of the saw teeth is so intense that the metal is melted and most of it turns into gas.

Eighteen such saws are now in use at Bell Aircraft for such operations as trimming of aircraft metals, and making boiler plate dies.

Cutters, used to mill aircraft metals, can be made faster, cheaper and better, Mr. Schwartz also suggested to the engineers. Remove six out of seven teeth on the large multi-bladed milling cutter commonly in use, he urged. Only four teeth are needed. With each taking a healthy bite, faster production and smoother finish results. This simplified machine also removes the old problem of not having enough power.

Pounds of critical high-speed steel are saved; cost and time are saved; and the cutter lasts longer at faster speeds.

To further conserve high-speed steels and carbides and speed production, Mr. Schwartz recommended that engineers use a wider selection of cutting materials for metal working.

Cast alloys have not been used as much as they should, he asserted. Tanning, one of the alloys, is now giving better results in certain phases of aircraft production than the usual high-speed steel or carbide.

*Science News Letter, April 3, 1943*

Controlled conditions in greenhouses simulate the desert climate demanded by such rubber shrubs as guayule and rabbit brush, while botanists seek information on factors that may increase their production, and carry on experiments trying for the best methods of extraction.

Of especial promise in this program, Dr. Trumbull stated, is the vine milkweed known botanically as *cryptostegia*, that grows freely in the Caribbean region. It bleeds latex from cut stems as a pruned grapevine bleeds sap. Frequent tapping—as often as every 48 hours—increases the yield without injuring the plant. X-ray studies indicate that the molecules of its rubber are identical with the product of the hevea tree. It is at present neither abundant nor cheap, but in the speaker's opinion is worthy of vigorous further attention.

*Science News Letter, April 3, 1943*

## Family to Increase

► THE PRE-WAR rubber industry was likened by Dr. M. C. Teague of the United States Rubber Company to a mother with only one child; after the war, he prophesied, there will be many children, of most diverse talents and abilities. Dr. Teague showed samples of several new rubber and rubber-like products, all of which are taking part in the war program in some capacity, from gas masks and Army raincoats to tires and tank-tread blocks. Whereas before the war the effort necessarily was to adapt the one known kind of rubber to many diverse uses, in the post-war world there will be many diverse kinds of rubber and rubber-like plastics, each to meet the one special use for which it will be "custom-built".

*Science News Letter, April 3, 1943*

## BOTANY—CHEMISTRY

# Manifold Uses of Rubber

► RUBBER'S manifold uses in war, and the heroic efforts made by both botanists and chemists to overcome the handicap imposed on the United Nations by the Japanese seizure of the lands that formerly supplied 90% of the world's rubber needs, occupied attention at the Ninth Annual Chemurgic Conference in Chicago. Representatives of leading rub-

ber companies, of a large research institute, and of a chemical firm took part in the discussions.

Dr. H. L. Trumbull of the B. F. Goodrich Company and Dr. Lewis Knudson of Cornell University both told of different phases of a special research program on rubber-producing plants carried on at Cornell's college of agriculture.

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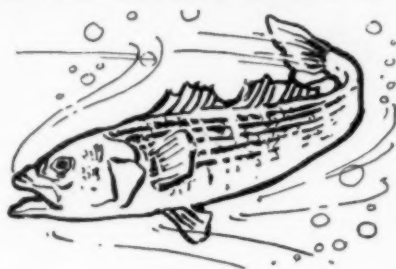
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### Water and Man

► MAN is usually given formal classification as a land animal, yet when we analyze him and his environment we find he is at least as much a water creature as a fish. His body consists largely of watery fluids and colloids, his watery foods are usually cooked in additional water, his dirt and wastes are removed principally by water, he does much of his traveling and freight hauling on water—in short, he just about swims and splashes his whole way through life.

The situation is vividly presented in a new book, *Conservation for Tomorrow's America*, by O. E. Fink, curriculum supervisor in conservation education for the state of Ohio.

Mr. Fink pictures man as the apex of a water pyramid with eight widening successive steps, representing the yearly water requirements of an adult person living in an average American city environment.

The tip of the pyramid, man's body, contains 70% of water. The first pyramid step is represented by 1,000 pounds of water in the food he eats, the second

by 3,000 pounds used by the body in keeping the proper salt dilution, the third by 100,000 pounds used in personal hygiene. Food production requires tremendous quantities of water. The fourth step on Mr. Fink's aqueous pyramid is a figure of 400,000 pounds of water used in the production of plant foods, the fifth is the water used in preparing dairy products—500,000 pounds. Meat and meat products require even vaster quantities of water in the sixth step: a good 10,000,000 pounds a year per carnivorous human.

The seventh step is the more modest quantity of 200,000 pounds of water used for municipal purposes, including not only such obvious outpourings as street-flushing and fire-fighting, but all water-requiring manufactures. These are often very thirsty things indeed: nearly 100 tons of water get used up for every long ton of steel produced; and a little over that ton (2,300 pounds) of new steel was used by the average family in a typical pre-war year.

The final step in the water pyramid cannot be measured, for it includes the use of water for travel, transportation, recreation and similar very general uses that require water but do not actually consume it.

Seen thus, the importance of water to modern life is brought to an acute focus, and the necessity for conserving it and preventing pollution from rendering it unavailable impresses itself with particular weight upon the average citizen's consciousness.

*Science News Letter, April 3, 1943*

### PSYCHOLOGY

## Books Can Aid Health As Well as Amuse

► MOST OF US, young and old, read books solely for entertainment. Properly selected and read, they can also be an aid to health, it appears from two medical reports. This does not refer to books about health, physiology, hygiene, and the like, but to books which would ordinarily be classed as the kind to be read for enjoyment, not learning.

The first report was by Dr. Ralph H. Pina, editor of a medical journal, the *Detroit Medical News*. Under the heading "Riches from Rationing" he suggests to his fellow doctors that they try books as a substitute for the Sunday afternoon or evening ride to the country or a friend's house which must be given up because of gas rationing. If that's good medicine for the doctors, it should be good medicine for the rest of us. And from the

authors Dr. Pina suggests as Sunday afternoon or evening companions, Whitman, Thoreau, Hawthorne, Lowell, Holmes, among others, he clearly has in mind treatment for rationing blues and war despondency as well as entertainment.

The second report was by Dr. Thomas Verner Moore, of Catholic University, who believes bibliotherapy, or, book treatment, can be used to help problem children. Dr. Moore reported success with bibliotherapy in the case of one 11-year-old, Charles, who could not put up with correction from a foster-aunt, was lazy at school, and refused to share his toys with a younger brother. The home situation was bad, in that Charles' father was dead and he, his mother and younger brother had to share an apartment with the foster-aunt and her family so that the mother could work.

The home situation could not easily be changed, and Dr. Moore tried to teach Charles to adjust better to it, especially since the boy will not be able to go through life successfully without learning to deal with many other more or less unreasonable persons in authority. After a few periods of play treatment during which Charles accepted the doctor as a friend, Dr. Moore started lending him books to read. Charles chose his own at first, and then the doctor began giving him books, biographies, for example, from which he could learn certain principles such as persistence in the face of great difficulties, willingness to learn from correction without getting angry, readiness to share possessions.

*Science News Letter, April 3, 1943*

## ● RADIO

Saturday, April 10, 1:30 p.m., EWT

"Adventures in Science" with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Edwin Morris Betts, of the University of Virginia, will speak on "Thomas Jefferson as a Gardener."

Monday, April 5, 9:15 a.m., EWT; 2:30 p.m., CWT; 9:30 a.m., MWT; and 1:30 p.m., PWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service and Science Clubs of America.

"Freedom from Want" will be the subject of the program.

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# • New Machines and Gadgets •

✿ **COLORED PLASTIC** lamps lashed to aerial delivery containers help troops locate and identify their supplies and equipment at night. Floating to earth by parachute, the light identifies different kinds of material by color. Interchangeable, transparent lens caps mark the different containers in five colors.

Science News Letter, April 3, 1943

✿ **A NEW DEVICE** for physicians locates metal particles in the eye with a transparent plastic lens. The hollow base of the lens fits snugly over a plastic handle which holds a wire and tiny activating magnet that removes the offending particle.

Science News Letter, April 3, 1943

✿ **A SNAKE BITE** kit now used extensively by the Army Medical Corps contains tourniquet, bandages, iodine and ammonia capsules carried in a dust-proof, watertight plastic case. A plastic suction pump is included to remove venom from the wound. Plastic is said to be an improvement over the original aluminum pump because the metal is so easily bent.

Science News Letter, April 3, 1943

✿ **NOVEL HUMIDITY** indicators are used to show probable moisture damage to airplane engines and other equipment protected by dehydration inside transparent plastic bags. Blue hygroscopic crystals are placed between a small sheet of starched cotton mesh and a clear win-

dow, bound together in a cardboard frame as shown in the photograph. This is placed inside the protective covering. Moisture causes the crystals to turn pink.

Science News Letter, April 3, 1943

✿ **OIL-IMPREGNATED** condenser bushings save 40% of the shellac formerly used. The product is said to be superior in many ways to the bushing previously built. Shellac substitutes are necessary because imports from India have been cut off by the war.

Science News Letter, April 3, 1943

✿ **A BABY CARRIAGE TRACK** to help get the loaded carriage up and down a flight of stairs has recently been patented. Angle bars with horizontal and

vertical flanges constitute the tracks. They are held the proper distance apart with adjustable rods. Special adjustable fasteners hold them in place on the stairs. These may be arranged to fit any treads. Length may be varied by telescopic adjustment.

Science News Letter, April 3, 1943

✿ **LEATHER FINGER GUARDS** protect metal-working employees who do sanding, grinding or punch press work. The finger guards have leather fronts and tips backed by an elastic material.

Science News Letter, April 3, 1943

If you want more information on the new things described here, send a three-cent stamp to Science News Letter, 1719 N. St., N. W., Washington, D. C., and ask for Gadget Bulletin 150.

## • Just Off the Press •

**AMERICAN AVIATION DIRECTORY**—American Aviation Associates, various paging, \$5. "Aviation officials and companies, United States, Canada and Latin America, Fall-Winter, 1942."

**BASIC MATHEMATICS FOR PILOTS AND FLIGHT CREWS**—C. V. Newsom and Harold D. Larsen—Prentice-Hall, 153 p., illus., \$2. Circular slide rule included with book.

**BEHIND THE SULFA DRUGS: A Short History of Chemotherapy**—Iago Galdston—Appleton-Century, 174 p., \$2.

**BETTER DRESSMAKING**—Ruth Wyeth Spears—Barrows, 256 p., illus., \$3. All sewing details carefully and clearly explained. A dictionary of fabrics and fabric terms is included.

**BUILDING MODEL WAR PLANES FOR THE ARMY AND NAVY**—Emanuele Stieri—Duell, Sloan and Pearce, 90 p., illus., \$2.50.

**CREATINE AND CREATININE METABOLISM**—Howard H. Beard—Chemical Pub. Co., 376 p., \$4. Textbook which may be used by "technicians not especially trained in analytical chemistry."

**ELEMENTARY AVIGATION**—L. E. Moore—Heath, 222 p., illus., \$1.60. Written by a mathematics teacher.

**FOREST RESOURCES OF THE PONDEROSA PINE REGION OF WASHINGTON AND OREGON**—R. W. Cowlin, P. A. Briegleb and F. L. Moravets—Govt. Print. Off., 99 p., illus., 40c. (United States Department of Agriculture Miscellaneous Publication No 490.)

**THE FRIENDLY ARCTIC: The Story of Five Years in Polar Regions**—Vilhjalmur Stefansson—Macmillan, 812 p., illus., \$5.

**INTRODUCTION TO ORGANIC AND BIOLOGICAL CHEMISTRY**—L. Earle Arnow and Henry C. Reitz—Mosby, 736 p., illus., \$4.25. Textbook.

**LEGAL PROTECTION FOR THE SERVICEMAN**

**AND HIS FAMILY: The Latest 1943 Information**—Vincent Lo Lordo and Victoria Brown—Julian Messner, 80 p., \$1. By the staff attorneys of the Legal Aid Society of New York.

**THE MARCH OF MEDICINE**—The New York Academy of Medicine Lectures to the Laity, 1942—Columbia Univ. Press, 217 p., \$2.50.

**ORIGIN LEGEND OF THE NAVAHO FLINTWAY**—by Father Berard Haile—Univ. of Chicago Press, 319 p., \$3.

**POISONOUS REPTILES OF THE WORLD: A WARTIME HANDBOOK**—Doris M. Cochran—Smithsonian Institution, 37 p., illus., Free upon direct application to Smithsonian Institution. (Smithsonian Institution War Background Studies No. 10.)

**REPORTS OF THE BIOCHEMICAL RESEARCH FOUNDATION OF THE FRANKLIN INSTITUTE**—Biochemical Research Foundation, various paging, illus. VOL. VI—1940-1941. Distributed to libraries and research laboratories.

**SOUTHEASTERN ASIA AND THE PHILIPPINES**—Lennox A. Mills, Editor—American Academy of Political and Social Science, 226 p., \$2 paper, \$2.50 cloth. (The Annals of The American Academy of Political and Social Science, Volume 226, March 1943.)

**SUPPLEMENT TO BUILDING MODEL WAR PLANES**—Emanuele Stieri—Duell, Sloan and Pearce, 60 full size construction patterns, \$1.25.

**STATISTICS OF SPECIAL SCHOOLS AND CLASSES FOR EXCEPTIONAL CHILDREN 1939-1940: Volume II, Chapter V**—Elise H. Martens and Emery M. Foster—Govt. Print. Off., 199 p., 30c. "Biennial survey of education in the United States, 1938-40."

**WILDLIFE REFUGES**—Ira N. Gabrielson—Macmillan, 257 p., illus., \$4.

Science News Letter, April 3, 1943

